

**Montana Board of Oil and Gas Conservation
Environmental Assessment**

Operator: Whiting Oil and Gas Corporation

Well Name/Number: Watts 41-21-2H, 3H, 4H (3 wells)

Location: SE NE Section 21 T24N R59E

County: Richland, MT; Field (or Wildcat) W/C (Bakken Horizontal)

Air Quality

(possible concerns)

Long drilling time: No, 30 to 40 days drilling time.

Unusually deep drilling (high horsepower rig): No, triple derrick drilling rig to drill 3 single lateral Bakken Formation wells, about 20,000' MD/10,400' TVD.

Possible H₂S gas production: Yes possible H₂S gas, slight chance from Mississippian Formations.

In/near Class I air quality area: No Class I air quality area, in the area of review.

Air quality permit for flaring/venting (if productive): Yes, DEQ permit required if productive. If existing pipeline for H₂S gas in the area, gas can be gathered or if no gathering system nearby, sweet gas or H₂S gas can be flared under Board Rule 36.22.1220.

Mitigation:

- ☐ Air quality permit (AQB review)
- ☐ Gas plants/pipelines available for sour gas
- ☐ Special equipment/procedures requirements
- ☐ Other: _____

Comments: No special concerns – using triple derrick drilling rig to drill 3 single lateral Bakken Formation wells.

Water Quality

(possible concerns)

Salt/oil based mud: Yes, oil based invert mud system will be used for drilling the mainhole and saltwater for drilling the horizontal lateral. Freshwater and freshwater mud system will be used for drilling the surface hole.

High water table: No, no high water table anticipated.

Surface drainage leads to live water: Yes, nearest drainage is an unnamed ephemeral tributary drainage to Second Hay Creek, adjacent to the southeast corner of this location. Within this ephemeral drainage there are stock ponds.

Water well contamination: None, closest water wells are about $\frac{3}{4}$ of a mile to the west and about $\frac{5}{8}$ of a mile to the east southeast from this location. Depth of these water wells range from 35' to 80'. Surface hole will be drilled with freshwater and freshwater mud to 1659'. Steel surface casing will be run and cemented from 1659'.

Porous/permeable soils: No, variable sandy clay soils.

Class I stream drainage: No Class I stream drainages in the area of review.

Mitigation:

- ☒ Lined reserve pit
- ☒ Adequate surface casing
- ☐ Berms/dykes, re-routed drainage
- ☐ Closed mud system
- ☐ Off-site disposal of solids/liquids (in approved facility)

X Other: Semi-closed loop mud system, utilizing a lined cuttings pit for burial of drill cuttings on the wellsite.

Comments: Surface casing cemented to surface adequate to protect freshwater zones and will cover the base of the Fox Hills Formation.

Soils/Vegetation/Land Use

(possible concerns)

Stream crossings: No, stream crossings anticipated.

High erosion potential: No, moderate cut, up to 11.6' and moderate fill, up to 10.6', required.

Loss of soil productivity: None, location to be restored after drilling well, if well is nonproductive. If productive unused portion of drillsite will be reclaimed.

Unusually large wellsite: No, a very large location, 510'X425'. This size location is required to accommodate four (4) wells, watts 42-21-1H, Watts 42-21-2H, Watts 42-21-3H and Watts 42-21-4H.

Damage to improvements: Slight, surface use is a cultivated land.

Conflict with existing land use/values: Slight

Mitigation

___ Avoid improvements (topographic tolerance)

___ Exception location requested

X Stockpile topsoil

___ Stream Crossing Permit (other agency review)

X Reclaim unused part of wellsite if productive

___ Special construction methods to enhance reclamation

___ Other _____

Comments: Access to location will be over existing county road, #132 and existing lease road. A short access of 22' will be built off the existing lease road into this location. Oil based invert drilling fluids will be recycled. Completion fluids will be hauled to North Dakota to be used on other wells or hauled to a Class II Disposal. Drilling cuttings and mud solids will be fly ashed in the lined cuttings pit. No special concerns.

Health Hazards/Noise

(possible concerns)

Proximity to public facilities/residences: Residence, about 1/2 of a mile to the south southwest from this location. Out buildings about 1/4 of a mile to the southeast from this location.

Possibility of H2S: Slight possibility of H2S.

Size of rig/length of drilling time: Triple drilling rig/short 30 to 40 days drilling time

Mitigation:

X Proper BOP equipment

___ Topographic sound barriers

___ H2S contingency and/or evacuation plan

___ Special equipment/procedures requirements

___ Other: _____

Comments: Adequate surface casing and operational BOP equipment should mitigate any problems. No concerns

Wildlife/recreation

(possible concerns)

Proximity to sensitive wildlife areas (DFWP identified): None identified.

Proximity to recreation sites: None identified

Creation of new access to wildlife habitat: No

Conflict with game range/refuge management: No

Threatened or endangered Species: Species identified as threatened or endangered are the Pallid Sturgeon, Interior Lease Tern, Whooping Crane and Piping Plover.

Candidate species are the Greater Sage Grouse and the Sprague's Pipit. MTFWP

Natural Heritage Tracker website indicates one (1) species of concern is Whooping Crane. NH Tracker website lists three (3) Potential Species of Concern: Chimney Swift, Eastern-Screech Owl and the Tennessee Warbler.

Mitigation:

☐ Avoidance (topographic tolerance/exception)

☐ Other agency review (DFWP, federal agencies, DSL)

☐ Screening/fencing of pits, drillsite

☐ Other: _____

Comments: Private surface lands. There maybe species of concern that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to what he would like done, if a species of concern is discovered at this location. The Board of Oil & Gas has no jurisdiction over private surface lands.

Historical/Cultural/Paleontological

(possible concerns)

Proximity to known sites None identified.

Mitigation

☐ avoidance (topographic tolerance, location exception)

☐ other agency review (SHPO, DSL, federal agencies)

☐ Other: _____

Comments: Private surface lands. There maybe possible historical/cultural/paleontological sites that maybe impacted by this wellsite. We ask the operator to consult with the surface owner as to his desires to preserve these sites or not, if they are found during construction of the wellsite. The Board of Oil & Gas has no jurisdiction over private surface lands.

Social/Economic

(possible concerns)

☐ Substantial effect on tax base

☐ Create demand for new governmental services

☐ Population increase or relocation

Comments: Wildcat well, no concerns.

Remarks or Special Concerns for this site

To drill 3 wildcat single lateral Bakken Formation wells

Summary: Evaluation of Impacts and Cumulative effects

No significant long term impacts expected, some short term impacts will occur.

I conclude that the approval of the subject Notice of Intent to Drill (does/**does not**) constitute a major action of state government significantly affecting the quality of the human environment, and (does/**does not**) require the preparation of an environmental impact statement.

Prepared by (BOGC): /s/Thomas Richmond

(title:) Administrator

Date: December 31, 2013

Other Persons Contacted:

Montana Bureau of Mines and Geology, GWIC website

(Name and Agency)

Water wells in Richland County

(subject discussed)

December 31, 2013

(date)

US Fish and Wildlife, Region 6 website

(Name and Agency)

ENDANGERED, THREATENED, PROPOSED AND CANDIDATE SPECIES

MONTANA COUNTIES, Richland County

(subject discussed)

December 31, 2013

(date)

Montana Natural Heritage Program Website (FWP)

(Name and Agency)

Heritage State Rank= S1, S2, S3, T25N R58E

(subject discussed)

December 31, 2013

(date)

If location was inspected before permit approval:

Inspection date: _____

Inspector: _____

Others present during inspection: _____